

REMARKS

Claims 1-28 are pending in the application. Of these claims, claims 1-8 have been rejected and claims 9-11 have been objected to. The balance of the claims have not yet been acted upon. The Examiner has indicated that claim 4 would be allowable if rewritten in independent form. By this response, claim 4 has been amended to be independent and claims 1-3 and 5-28 have been amended.

Applicant respectfully submits that there are 28 claims pending in the application. Filing Receipts dated 10/11/2001 and 06/05/2002 indicate 26 claims. However, the Substitute Application, incorporated in the Preliminary Amendment filed July 25, 2001 with the original application, has 28 claims. In order to clarify the present status of the application, Applicant herewith encloses a copy of the Substitute Application. Applicant's response to this Office Action, including the amendments above, is based on the claims contained in the Substitute Application.

Applicant notes that the Examiner has indicated that claims 9-11 were not examined due to multiple dependency issues. These claims in the Substitute Application do not have this issue.

The Examiner states that the application does not contain an Abstract. The Examiner's attention is directed to page 31 of the Substitute Application.

The Examiner indicates the specification should be checked to the extent necessary to determine the presence of all possible minor errors. The Substitute Specification has been examined as to this issue and no changes have been made. Applicant has, however, made changes to the claims for clarification and to correct formal issues. Applicant submits the specification is now appropriate.

The Examiner has made numerous 35 U.S.C. §112, second paragraph, rejections. Applicant has amended the claims, including the yet to be acted upon claims in the application, to address the identified issues.

The Examiner has rejected claims 1-3 and 6-8 under 35 U.S.C. §103(a) as being unpatentable over Bourdel in view of Strashum et al. or Morgan et al. As claim 5 is not addressed elsewhere in the Office Action and is not indicated to be allowable, Applicant has assumed that this rejection was also meant to apply to claim 5. Claims 1 and 5 are independent claims.

Bourdel is directed to an apparatus for extracting solid residues from an aqueous slurry. In the apparatus of Bourdel, the hot aqueous slurry is continuously deposited on a top face of a wall of a heat exchanger for drying. Col. 5 lines 38-45. A series of crusher rollers are provided for enhancing breaking up and spreading out the partially dried aqueous slurry. Col. 7-8 lines 58-4.

Strashun discloses a method for the continuous dehydration of edible liquids in a dehydrator. In the method, the liquid is expanded in volume prior to being applied to a belt within the dehydrator. The expansion is accomplished by extracting gas from a gasified concentrate using a vacuum. Col. 3 lines 41-53. The liquid is maintained in an expanded condition throughout the dehydration process. By maintaining the liquid in an expanded condition, the rate of dehydration is increased, the resulting dehydrated product releases more easily from the drying surfaces, and rehydration is more satisfactory. See Col. 1, lines 45-52.

Morgan discloses a method for dehydration of an aqueous dispersion. In the method, the dispersion is initially foamed for application onto a belt that transports the foamed dispersion to the dehydration chamber. Col. 1 lines 62-65. During dehydration, the dispersion retains its foam consistency. Col. 2 lines 1-2. By maintaining the foam volume, reconstitution is enhanced. Col. 2 lines 12-13.

Claim 1 recites that the fluid matter with the solid residue suspended therein is expanded greatly in volume to give it a foam consistency. Additionally, the claim recites that the fluid matter with the solid residue therein after it is in a foam consistency is applied to a heat exchange wall and crushed to encourage crumbling

and spreading. Strashun or Morgan teach giving a liquid and an aqueous dispersion, respectively, to be dehydrated an initial foam consistency for application that is to be maintained throughout dehydration i.e., no crushing. Bourdel is silent on the issue of creating a foam. Therefore, these references taken alone or in combination do not teach or suggest the subject matter of claim 1, i.e., foaming a fluid matter for application and then crushing it during dehydration.


Claim 5 is similar to claim 1. Claim 5 is directed to an apparatus that has feeder and applicator means adapted to cause the fluid matter with solid residue therein to expand greatly in volume and to give it the consistency of a foam immediately before it is applied to a heat exchange wall. Claim 5 also has crushing means for encouraging crumbling and spreading of the applied layer of fluid matter with solid residue therein which has a foamed consistency. Applicant respectfully submits that Bourdel does not teach or suggest such an apparatus as Bourdel does not teach or suggest a feeder and applicator means for giving a fluid matter with solid residue therein a foam consistency. Applicant further submits that Strashun and Morgan do not disclose an apparatus that crushes fluid matter that has a foamed consistency, with the object of crumbling and spreading it prior to scraping as both references desire that the matter once given a foamed consistency remains foamed. Therefore, these references taken alone or in combination do not teach or suggest the crushing of fluid matter having a foamed consistency as defined in claim 5.

Applicant further submits that there is no motivation to combine Strashun or Morgan with Bourdel as suggested by the Examiner. There is no motivation to combine references where a reference teaches away from a proposed combination. *In re Gurley*, 31 U.S.P.Q. 2d 1130, 1131 (Fed. Cir. 1994). As stated above, Strashun and Morgan teach foaming fluid matter prior to dehydration and then maintaining the fluid matter in a foamed state, not crushed, during dehydration. As such, Strashun and Morgan teach away from the present subject matter of claims 1 and 5 that recite that the fluid foam matter is foamed for application, but then it is crushed during dehydration.

Applicant hereby requests a one-month extension, and a check in the amount of \$110 is enclosed to cover the fee associated therewith. Applicant believes no further fees are due for the filing of this response; however, if a fee is due please charge Deposit Account No. 13-0235.

Respectfully submitted,

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In the claims:

1[/]. (Amended) A method of extracting, by evaporation, solid residue in suspension and/or in solution in fluid matter containing volatile substances[, in particular aqueous matter], the method comprising the steps of:

a) applying in a zone on a hot face of a heat exchange wall [the] a fluid matter to be treated in the form of a thin layer with solid residue therein [to be treated in the form of a thin layer on the smooth and hot face of a heat exchange wall], the heat exchange wall being [which is] heated to a temperature that is high enough to cause [the water and/or other] volatile substances contained in the fluid matter to evaporate [quickly, said hot wall moving cyclically around a closed path];

b) crushing the layer of fluid matter with solid residue therein against [said] the hot face to level it and to encourage crumbling and spreading thereof; [and]

c) [at the end of a cycle, levaporating [recovering] substantially all the fluid matter leaving the solid [and dry] residue [that has formed] on [said] the hot face;

d) recovering substantially all the solid residue by scraping it off the hot face; and wherein a further step includes

[the method being characterized by the fact that immediately before applying the material, it is caused to] (e) expanding greatly in volume the fluid matter with solid residue therein immediately before applying it to the hot face so as to give it the consistency of a foam, such that it is the foam which is applied in the form of a thin layer on the hot face.

2[/]. (Amended) [A] The method according to claim 1, wherein [characterized by the fact that] in the step of expanding greatly in volume, the volume of the fluid matter with solid residue therein is expanded by a factor [lying] in the range of 20 to 100.

3[/]. (Amended) [A] The method according to claim 1, [characterized by the fact that] including the additional step of [particles that remain adhering to said hot face after the scraping operation are eliminated] eliminating solid residue remaining adhered to the hot face after recovering substantially all solid residue in order to

prepare the hot face for a subsequent application of fluid matter with solid residue therein to the zone [prevent them reaching the zone in which the foam is applied].

4[/]. (Amended) A method of extracting, by evaporation, solid residue in suspension and/or in solution in fluid matter containing volatile substances, the method comprising the steps of:

a) applying in a zone on a hot face of a heat exchange wall a fluid matter to be treated in the form of a thin layer with solid residue containing farm-yard manure therein, the heat exchange wall being heated to a temperature that is high enough to cause volatile substances contained in the fluid matter to evaporate quickly;

b) crushing the layer of fluid matter with solid residue therein against the hot face to level it and to encourage crumbling and spreading thereof;

c) evaporating substantially all the fluid matter leaving the solid residue on the hot face;

d) recovering substantially all the solid residue by scraping it off the hot face; and wherein a further step includes

e) expanding greatly in volume the fluid matter with solid residue therein immediately before applying it to the hot face so as to give it the consistency of a foam for application onto the hot face [A method according to claim 1, characterized by the fact that treated matter is farm-yard manure, in particular pig manure].

5[/]. (Amended) A machine for extracting solid residue to be found in suspension and/or in solution in fluid matter containing volatile substances[, and in particular aqueous matter], the machine comprising:

a) a heat exchange wall having a [smooth and] hot face which is heated to a temperature that is high enough to cause [the water and/or the other] volatile substances contained in the fluid matter to evaporate [quickly] to leave the solid residue [, said wall being movable cyclically around a closed path];

b) feeder and applicator means adapted to cause the fluid matter with solid residue therein to expand greatly in volume and to give it the consistency of a foam immediately before it is applied to the hot surface and for feeding and applying the

[matter] fluid matter with solid residue therein to be treated onto [said] the hot face [at the beginning of the cycle] in the form of a thin layer;

c) crushing means [suitable] for encouraging crumbling and spreading of the layer of [matter] fluid matter with solid residue therein on [said] the hot face; and

d) scraper means [operative at the end of the cycle] to recover at least a portion of the solid residue that has formed[;

the machine being characterized by the fact that said feeder and applicator means are adapted to cause the matter to expand greatly in volume and to give it the consistency of a foam immediately before it is applied, and to deposit said foam on the hot face in the form of a thin layer].

6[/]. (Amended) [A] The machine according to claim 5, in which [said] the heat exchange wall with the hot face is movable in a horizontal plane [and horizontal] in an advancing direction, [the machine being characterized by the fact that the means for expanding the volume of the matter comprise both] and wherein the feeder and applicator means includes a box placed over [said] the hot face, the box being downwardly open and having an open side facing in the advancing direction of the movable heat exchanger [on one side in the forward direction of advance of the moving] wall, [and feeder means for feeding the matter to be treated into the box, said] the box and the hot face defining a chamber in which the [matter] fluid matter with solid residue therein expands[, the bottom of the chamber being constituted by said moving hot face].

7[/]. (Amended) [A] The machine according to claim 6, [characterized by the fact that the matter] wherein [is fed into the box by means of] the feeder and applicator means includes a positive displacement pump [via] having an Archimedes' screw constituted by a brush mounted to rotate in a feed duct in fluid communication with the box.

8[/]. (Amended) [A] The machine according to claim 6, [characterized by the fact that] wherein the box has a top wall whose bottom face [is] lies in a plane [and horizontal and] parallel to the hot face, [said] the top wall being movable in a vertical

direction so as to be capable of being lowered and pressed against [said] the hot face in order to clean it.

9[/]. (Amended) [A] The machine according to claim [27] 6, [characterized by the fact that it includes] wherein the box has a top wall moveable in a vertical direction so as to be capable of being lowered and pressed against the hot face in order to clean it, and controllable motive means connected to the top wall [to cause said pump to stop momentarily, and simultaneously] to cause the top wall of the box to be lowered and pressed against the hot face[, and to do so] in a cyclical manner, [with said top wall being raised thereafter automatically by resilient return members].

10[/]. (Amended) [A] The machine according to claim 6, [characterized by the fact that] wherein [the outline of] [said] the box has a flared outline defining a narrow zone when seen from above, [is flared, with its opening being directed in the forward direction of advance of the moving wall,] and [matter] the fluid matter with solid residue therein is [being] fed [to the upstream portion of the box, in its] into the box through the narrow zone.

11[/]. (Amended) [A] The machine according to claim 5, [characterized by the fact that] wherein [said] the crushing means [comprise] has at least one flexible sheet which is pressed against the [matter] fluid matter with solid matter therein by resilient means [such as a spring blade].

12[/]. (Amended) [A] The machine according to claim 11, [characterized by the fact that] wherein [said] the at least one flexible sheet is coupled to a reciprocating driver [driven with reciprocating motion of small amplitude].

13[/]. (Amended) [A] The machine according to claim 11, [characterized by the fact that] wherein [said] the at least one flexible sheet is made of polytetrafluoroethylene.

14[/]. (Amended) [A] The machine according to claim 5, [characterized by the fact that] wherein [said] the scraper means [comprises] has a battery of cascading

scrapers [working in cascade], each scrapper connected to a driver [driven with] providing each scrapper a cyclical motion following a substantially elliptical path[s].

15[/]. (Amended) [A] The machine according to claim 5, in which [said] the heat exchange wall having a hot face is a rotary disk defining an outside edge [having a vertical axis with the top face of the disk constituting said hot face, the machine being characterized by the fact that] wherein the [said scrapers] scraper means is [are] arranged to transfer the solid residue progressively towards the outside edge [of the disk and] to cause [it] the solid residue to drop into a vertical collector well.

16[/]. (Amended) [A] The machine according to claim 15, [characterized by the fact that it includes] further including an additional scraper [suitable] suitably positioned to scrape [for scraping] the outside edge of the disk.

17[/]. (Amended) [A] The machine according to claim 15, [characterized by the fact that it includes] further including a fixed circularly arcuate side panel disposed beside the rotary disk immediately downstream from the feeder and applicator means [for applying the matter on the disk and] and oriented [serving] to prevent the [foam] fluid matter with solid residue therein from [escaping outwards] leaving the hot face.

18[/]. (Amended) [A] The machine according to claim 15, [characterized by the fact that it includes] further including means for mechanically removing [particles] solid residue that remains stuck to [said] the hot face, [said] the means for mechanically removing being situated downstream in the advancing direction of the heat exchange wall defined on the rotary disk from [said] the scraper means [and recovery means] and upstream from the feeder and applicator means.

19[/]. (Amended) [A] The machine according to claim 18, [characterized by the fact that] wherein [said] the means for mechanically removing the solid residue [particles comprise] has a pick-up metal sheet associated with at least one removal wormscrew.

20[/]. (Amended) [A] The machine according to claim [28] 19, [the machine being characterized by the fact that] wherein the [said particle removal] means for mechanically removing [are] is adapted to evacuate the [said particles] solid residue towards [the] an outside edge of the [disk] heat exchange wall on the rotary disk.

21[/]. (Amended) [A] The machine according to claim 15, comprising a [set] plurality of the [identical horizontal] rotary disks, each defining heat exchange walls mounted on a common vertical axis, each wall extending to an outer edge of the disks [that are closely spaced apart on the same vertical axis, which disks rotate together about their axis, the machine being characterized by the fact that it includes] and further including a heated annular collector track disposed [at the bottom of the machine,] vertically beneath the edges of the disks for collecting solid residue.

22[/]. (Amended) [A] The machine according to claim 21, [characterized by the fact that it has] further including a set of scrapers in the collection track rotating [turning] synchronously with the [set] plurality of rotary disks [in the collector track] and adapted to move [transfer particles that are to be] solid residue found therein towards an evacuation hole situated [at the] above a collector well.

23[/]. (Amended) [A] The machine according to claim 21, [characterized by the fact that it has] further including a scraper[s] adapted to scrap off [deposit] solid residue adhering to [the] a bottom face[s] of [the] at least one disk[s] so that the [said deposit] solid residue [drops onto the top faces of the underlying disks and/or into the collector track] is dislodged from the bottom face.

24[/]. (Amended) [A] The machine according to claim 21, in which [all of] at least two of the disks are hollow and are carried by a tubular shaft [whose] having an inside space in [communicates] communication with the inside space of [each] the hollow disks, [said] the spaces constituting a condensation chamber, the [said set of] hollow disks being mounted inside an evaporation chamber, and means for [the machine having a system for] extracting [the] vapor produced in the evaporation

chamber, means for mechanically compressing [said] the vapor, and means for introducing the compressed vapor into the condensation chamber.

25[/]. (Amended) [A] The machine according to claim 5, [characterized by the fact that it includes] further including means [a device] for extracting and compacting all of the solid residue[, e.g. a pair of hot moving endless belts].

26[/]. (Amended) [A] The machine according to claim 5, [characterized by the fact that it includes] further including means for washing [said] the hot face in hot water.

27[/]. (Amended) [A] The machine according to claim 7, [characterized by the fact that] wherein the box has a top wall whose bottom face is a horizontal plane [and horizontal] and parallel to the hot face, [said] the top wall being movable in a vertical direction so as to be capable of being lowered and pressed against [said] the hot face in order to clean it.

28[/]. (Amended) [A] The machine according to claim 5, in which [said] the heat exchange wall is a rotary disk and having a vertical axis [with the top face of the disk constituting said hot face, the machine being characterized by the fact that] wherein the scraping means [said scrapers] are arranged to transfer the solid residue progressively towards [the] an outside edge of the rotary disk and to cause it to drop into a vertical collector well and further including means for mechanically removing [particles] solid residue that remains stuck to [said] the hot face, [said] the means for mechanically removing being situated downstream in the advancing direction of the heat exchanging wall defined on the rotary disk from [said] the scraper [and recovery] means and upstream from the feeder and applicator means.